9. ADJUSTMENT

9-1. MECHANICAL ADJUSTMENT

9-1-1. Playback Tension Adjustment (See Fig. 1)

1. Remove Cover Housing Ass'y, Case Front Ass'y, Case Right Ass'y. (See section 3-1-1, 3-1-2, 3-1-3 on the page 3-1,3-3)
2. Supply DC 7.5V to Battery Terminal.

1) Set the Torque Cassette.
2) Set the Play mode, and confirm that Reel Disk S torque value is within 4.5 ± 1 g/cm.
3) If the torque value does not meet the specification, adjust the Tension Band.

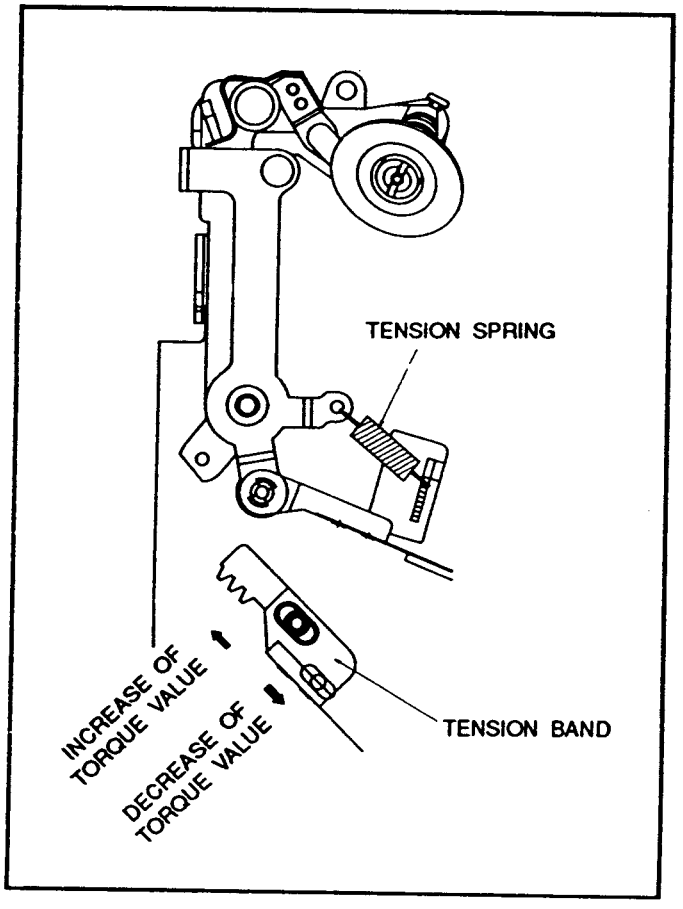


Fig. 1 Playback Tension Adjustment

9-1-2. Reel Torque Check

1) Set the Torque Cassette.
2) Set the Play mode, and confirm that Reel Disk T torque value 10.5 ± 3.5 g/cm.
3) Set the RPS mode and confirm that Reel Disk S torque value is within 35 ± 5 g/cm.
4) If the torque value does not meet the specifications, replace the corresponding Reel Disk.

9-1-3. Tape Path Adjustment

1. Layout of Tape Transport Adjustment

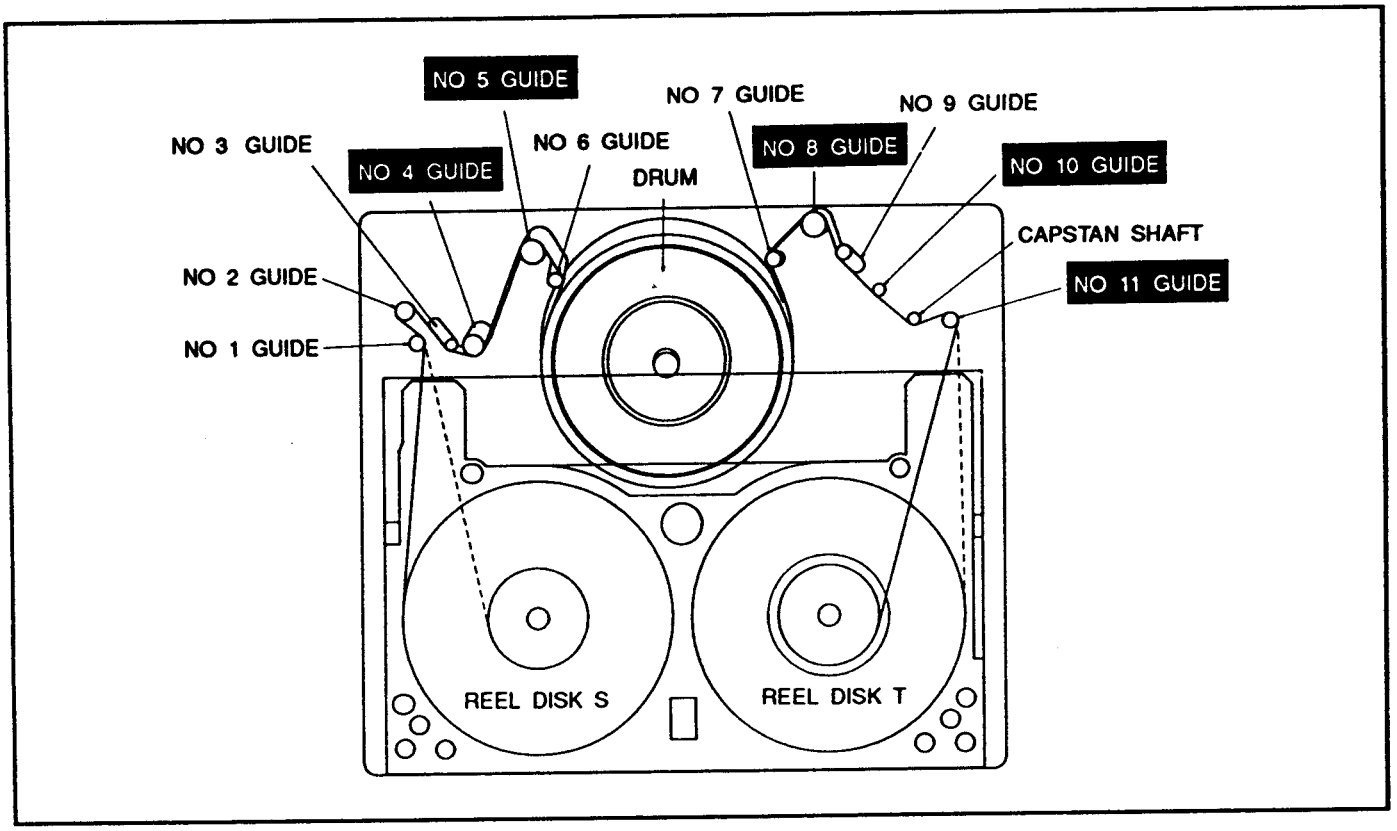


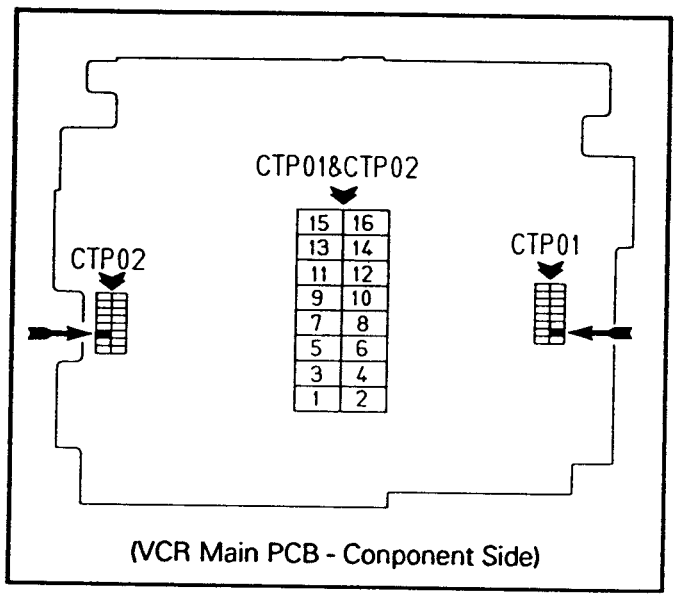
Fig. 2 Layout of Tape Transport Adjustment

Guide NO.	Component Name	Adjustment Purpose
NO. 1	Tension Pole	—
NO. 2	Roller Lever/G	—
NO. 3	Slant Pole SUB	—
NO. 4	Impedance Roller	Tape Height
NO. 5	Guide Roller "S"	Envelope
NO. 6	Pole Slant "S"	—
NO. 7	Pole Slant "T"	—
NO. 8	Guide Roller "T"	Envelope
NO. 9	Pole Slant CAP	—
NO. 10	Shaft Pole Guide	Tape Guide
NO. 11	Post Review Arm	Tape Wrinkle

2. Preparation for Adjustment

1) Clean tape path surfaces. (Guide Roller, Tape Guides, Drum) (See Fig. 2)
2) Connection of oscilloscope and output of waveform.

Test Point : Pin 5 of CTP02 (PB RF)
Pin 4 of CTP01 (H'D SW - Trigger)



(VCR Main PCB - Conponent Side)

3. Tracking Adjustment

1) Playback the alignment tape for tracking adjustment.
2) Confirm that both the entrance and exit side RF waveforms of oscilloscope are flat. (See Fig. 3) If they are not, adjust as follows. (Tracking fine adjustment)

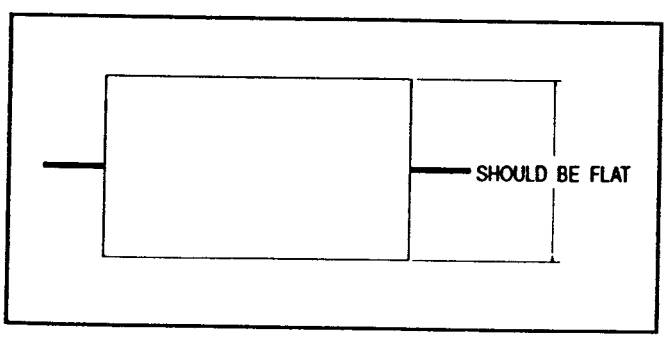


Fig. 3

4. Tracking fine Adjustment (See Fig. 4)

【1】 Playback the alignment tape for tracking adjustment.

≪Adjustment of Drum entrance side≫ .
1) Confirm whether the waveform is flat or not.
2) If it shows like A : Adjust No. 5 Guide (Guide Roller S) clockwise to get the flat envelope waveform.
3) If it shows like B : Adjust No. 5 Guide counterclockwise to get the flat envelope waveform.

≪Adjustment of Drum exit side≫
1) Confirm whether the waveform is flat or not.
2) If it shows like C : Adjust No. 8 Guide (Guide Roller T) colckwise to get the flat envelope waveform.
3) If it shows like D : Adjust No. 8 Guide counterclockwise to get the flat envelope waveform.

【2】Reconfirm the envelope waveform.

1) After following step 【1】 reconfirm that envelope waveform has not changed.
2) If it's changed, please repeat step 【1】.

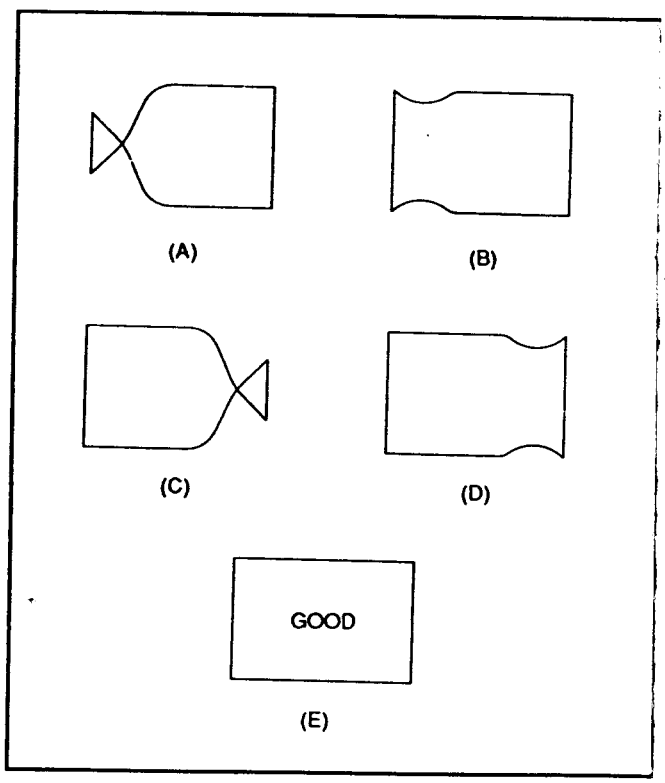


Fig. 4

5. Tape Guide Adjustment

【1】 No. 4 Guide Adjustment (See Fig. 5 and 6)

1) Playback the alignment tape.
2) Check that the tape is not bent at the Lower Flange.
3) Guide the tape to the Lower Flange.
4) CUE/RPS the tape, then Play it Back and confirm that the RF waveform rises flat within 2.5 seconds. (See Fig. 5)
5) If the waveform is not normal, repeat step 3) and 4) until a normal waveform is obtained.

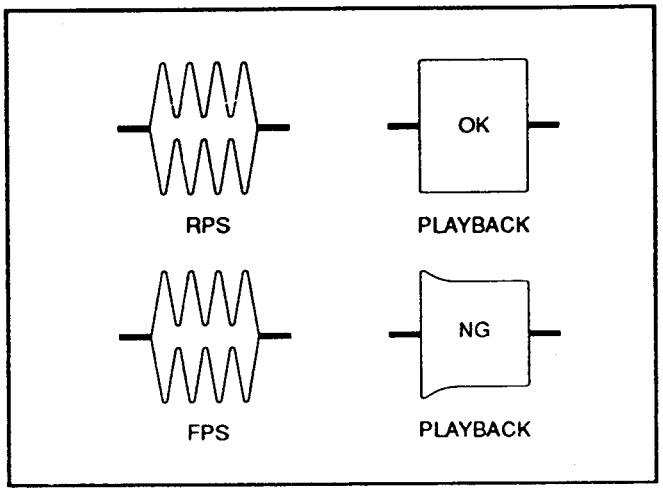


Fig. 5

【2】 No. 10 Guide Adjustment (See Fig. 6)

1) Playback the alignment tape and guide the tape to the Lower Flange.
2) CUE/RPS the tape, then Play it Back and confirm that the tape is not bent at the Flange, instead of check that RF waveform rises flat within 2.5 seconds in the PLAYBACK mode.
3) If the waveform is not normal, repeat steps 1) and 2) until a normal waveform is obtained.
4) If the tape is bent in the RPS mode, Adjust No. 11 Guide until the tape is straightened.

【3】 No. 11 Guide Adjustment (See Fig. 6)

1) Playback the alignment tape.
2) Check that the tape is not bent between No. 10 Guide and Capstan.
3) Set the Play mode again and confirm that the tape is not bent. If the tape is bent, repeat steps 1) and 2).

【4】 CUE and RPS Waveform Check (See Fig. 7)

1) Playback the alignment tape for tracking adjustment and set the RPS mode. Confirm that waveform peaks maintain a constant pitch for 5 seconds or more. In case pitch is not constant, perform section 4 (See page 5-3) tracking fine adjustment and section 5 tape guide adjustment. (No. 11 Guide)
2) Set the CUE mode and confirm that waveform peaks maintain a constant pitch for 5 seconds or more, otherwise, perform section 4 (See page 5-3) and section 5. (No. 4 Guide)

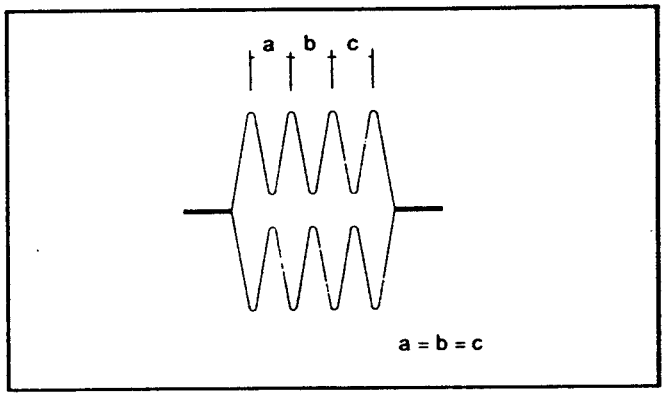


Fig. 7

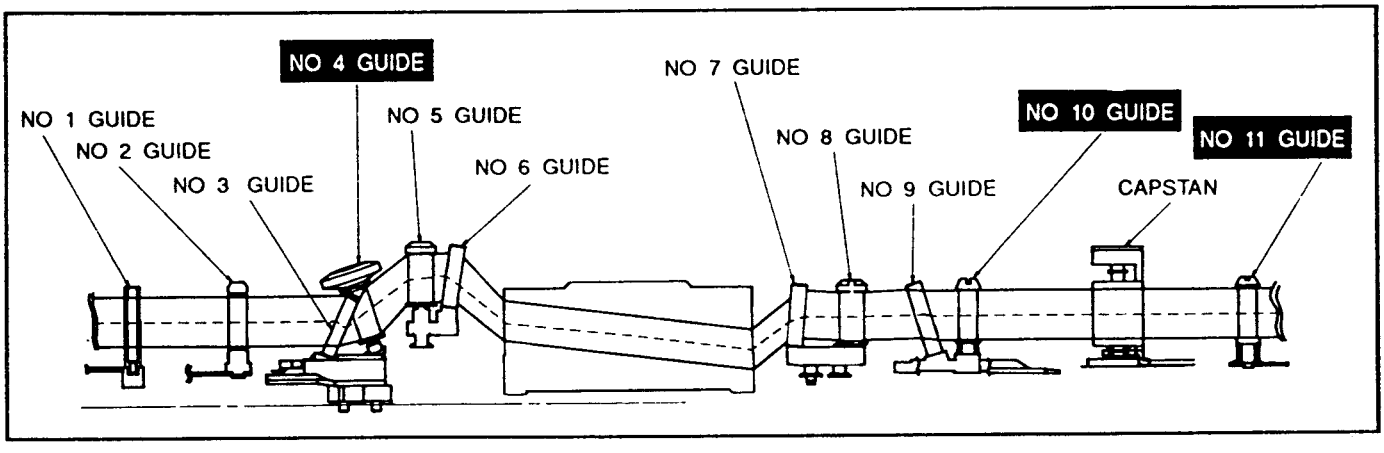


Fig. 6 Tape Travel Diagram

9-1-4. Check After Adjustment

1. Tape Path Check (See Fig. 6)

1) Playback a tape and confirm that no tape rising and curling occur at the Lower Flange of No. 4 Guide, the Upper Flange of No. 8 Guide, the Lower Flange of No. 10 Guide and the No. 11 Guide Upper and Lower Flanges.
2) In the FPS, RPS, FF, REW mode, check step 1 again.
3) If no tape rising and curling occur, repeat section 4 (See page 5-3) and 5 (See page 5-4) once more.

2. Envelope Stability Check

1) Playback the alignment tape.
2) Eject the tape, then load it again.
3) Confirm the envelope waveform.

*** STOP → PLAY ;**

Set the Play Back mode and confirm that RF waveform rises flat within 2.5 seconds, also confirm that the tape is not bent around the Pinch Roller.

*** FPS/RPS → PB, FF/REW → PB ;**

CUE/RPS and FF/REW the tape, then Play it Back and confirm that the RF waveform rises flat within 2.5 seconds also confirm that the tape is not bent around the Pinch Roller.

3. Tracking Check

1) Playback the alignment tape.
2) Then confirm that the minimum amplitude value (Emin) is 65% of the maximum value (Emax) or larger. (See Fig. 8 (A))
3) Confirm that no large fluctuations occur on the waveform. (See Fig. 8 (B))

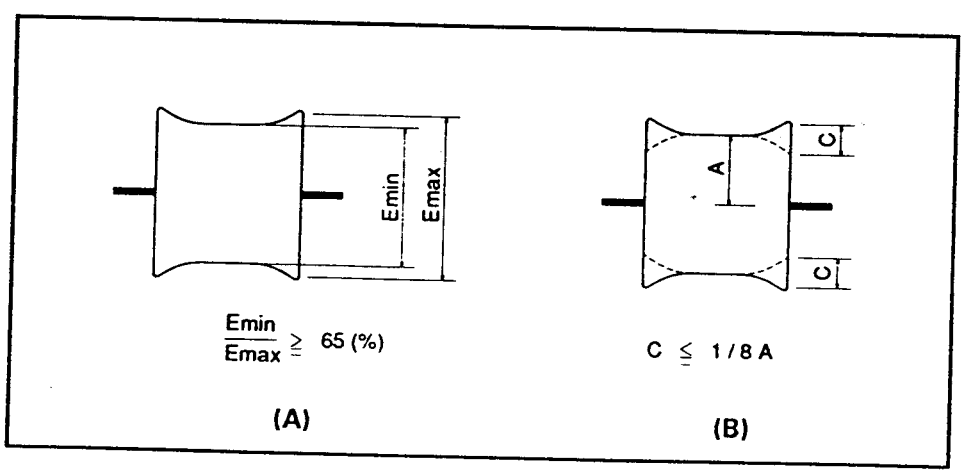


Fig. 8

4. Self-Recording Envelope-Waveform Check

1) After self-recording in the SP mode playback the tape and confirm that the RF waveform meets the specification. (See Fig. 9)
   Also, check that the level of the amplitude value meets specification. (See Electronic specification)
2) In each mode, confirm that the difference of the amplitude (CH1 and CH2) is 65% or larger. (See Fig. 9)
   If it does not meet specification, change Drum Ass'y to a new Drum Ass'y.

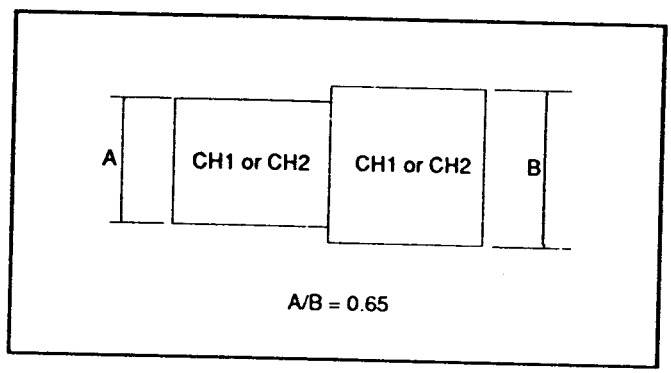


Fig. 9

9-2. CAMERA SECTION ADJUSTMENT

NOTE

This CAMERA System has
- **EVR (Electronic Variable Resistor) control method by D/A converter instead of VR control method.**
- **EEPROM to store the confirmed adjustment data.**
- **DSP (Digital Signal Process ; ICP01 - Camera Main PCB) chip to process the signal of Camera parts.**
- **One Test point for the frequency adjustment of DSP main clock (P. CLK).**
- **The special mode for Camera adjustment using remote control card.**

Keep in mind ;
1. Readjustment is needed when the lens assembly is removed from CCD board. The reason is that shifting of zoom track or iris level occurs when the CCD board and lens assembly are reassembled after servicing.
2. Readjustment is needed when the EEPROM (ICA02 of Camera Main PCB) and zoom lens assembly are replaced. The reason is that EEPROM stores confirmed adjustment value of each adjustment step.
3. All adjustment steps of the camera section should be performed using the remote control card.

9-2-1. Preparations

1. Equipment to be used

1) DC Power supply
2) Oscilloscope
3) Frequency Counter
4) Vectorscope
5) Waveform monitor
6) Color monitor or TV
7) Various charts
   - Color bar chart
   - Gray-scale chart, etc ...
8) Alignment tape (Lion pattern)
9) Remote Control card

2. Composition of Camera P.C.Boards

1) Camera Main PCB
2) AUTO PCB
3) CVF PCB

3. Adjustment Preparations

- Remote Control Card is used as a Camera Adjust Tool.
- Press the confirm button when each manual adjustment step is completed to write the adjustment data to the EEPROM.
- After each adjustment step is completed, OSD shows "OK".
- To cancel the adjustment mode, remove the power source.
- Press and hold the "MODE UP" or "MODE DOWN" button, mode will skip 4 steps.

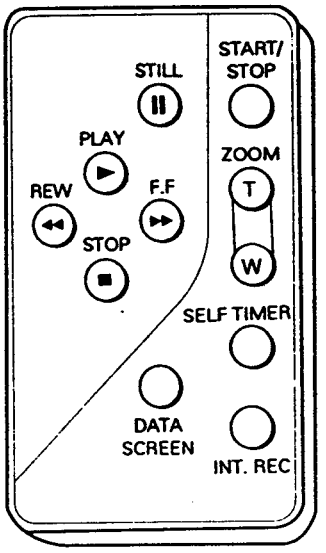
4. Remote Control

*The following is a chart explaining the use of each button :

USING BUTTON	ADJUSTMENT
CONFIRM	DATA stored after finishing adjustment by mode or enable to automatic adjustment mode.
DATA UP DATA DOWN	When changing DATA value of adjust state.
MODE UP MODE DOWN	Mode change.
NEAR FAR	Focus adjustment.
WIDE TELE	Used for manual focus adjustment.

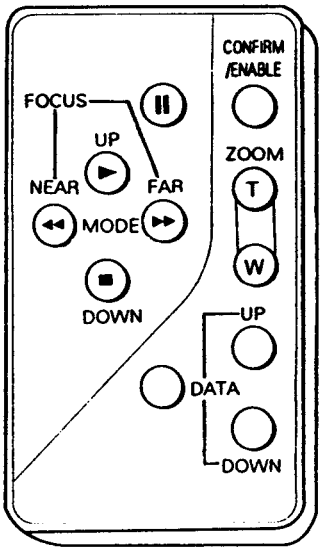
This remote is used to control the camcorder. It is also used to adjust the camera section when the unit is in service "ADJUST" mode.

Remote for Camcorder



REASSIGNMENT
IN THE
ADJUSTMENT MODE

Figure of Button Placement when remote is used for Service Adjustments.

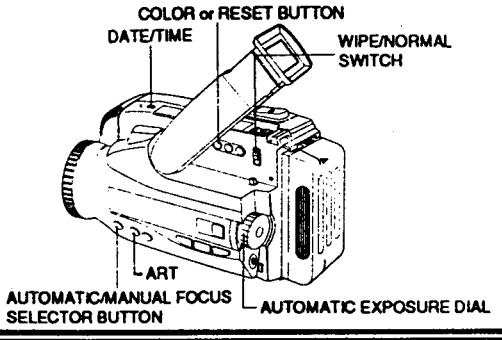


Note: In Service Adjustment mode, button names are different from those in customer camera function control mode.
EX) start/stop button is the same as Confirm/Enable.

5. How to get into service "ADJUST" mode.

STEP 1

1. Remove the lithium battery from the camcorder.
2. Connector the power source (battery/DC cable).
3. Eject the tape if it is in the unit.
4. Set the power switch of the camcorder to "CAM" position.
5. Set OSD on state.



STEP 2

1. Press the "A/M Focus" button on the left case, OSD shows "M. Focus"
2. Press the "ART" button three times on the left case OSD shows " ☞3".
3. Turn the "Auto Exposuere" S/W to SUNNY(the end of left side) OSD shows "SUNNY"
4. Press and hold thd "TIME/DATE" button on the upper case more than 5 seconds, and then press the button 3 times. OSD blink at the time position.
5. Lift up color view finder, set "WIPE/NORMAL" S/W to normal position. Press and hold the "RESET" button more than 5 seconds.

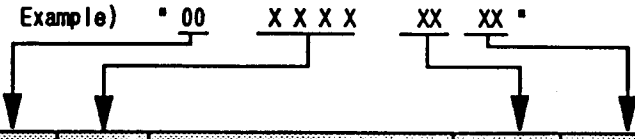
STEP 3

"ADJUST" will now be blinking at center of screen. Now press "START/STOP" button of remote control card.

On screen display shows "59 ASET XX XX" CAMERA ADJUSTMENT mode has successfully been activated.

6. Initial data of camera parts adjustment

During camera adjustment, the OSD displays the following abbreviations to indicate the selected mode.



Note : "DATA 1" is previous setting in momory, "DATA 2" is now adjustment setting, that changes during adjustment mode. After pressing "START/STOP(CONFIRM)", it goes to memory.

Mode	O S D	Name of adjustment	Data 1	Data 2
59	ASET	AUTO SET-UP	00	00
54	A-HL	AUTO HALL	00	00
52	A-IR	AUTO IRIS	00	00
53	AGC	AUTO AGC	00	00
55	AWB	AUTO WHITE BALANCE	00	00
00	Y-R	Y GAMMA	90	90
01	VSUB	VOLTAGE SUB	66	66
02	IRIS	IRIS CONTROL	7A	7A
05	VRG	VOLTAGE RESET-GATE	62	62
06	M-HL	HALL REF	26	26
08	LENS	ZOOM TRACK ADJ.	85	85
12	COV2	AUTO KNEE COEF 2	68	68
13	CAP	APERTURE GAIN CONTROL	F0	F0
14	CC0A	COLOR SEPARATION COEF 1	21	21
15	CC0B	COLOR SEPARATION COEF 2	33	33
16	CAKP	AUTO KNEE POINT	D0	D0
17	CNSL	NOISE SLICE LEVEL	02	02
18	CAPS	EDGE CHROMA GAIN	00	00
19	CRCO	CCR GAIN	40	40
1A	CBCO	CCB GAIN	40	40
1B	CGCO	YL GAIN	80	80
1E	MRPW	R PRE-WHITE BALANCE	40	40
1F	MGPW	G PRE-WHITE BALANCE	20	20
20	MBPW	B PRE-WHITE BALANCE	40	40
21	MRWB	R WHITE BALANCE	3C	3C
22	MBWB	B WHITE BALANCE	47	47
23	MDSR	DARK SLICE R	02	02
24	MDSB	DARK SLICE B	00	00
25	MDSG	DARK SLICE G	FD	FD
26	MRHC	R-Y HUE	19	19
27	MBHC	B-Y HUE	19	19
28	MRYG	R-Y GAIN	34	34
29	MBYG	B-Y GAIN	24	24
45	EHBB	B-Y BURST CARRIER GAIN	CE	CE
46	EHBR	R-Y BURST CARRIER GAIN	00	00
47	ECFA	CHROMA FADE CONTROL	40	40
48	EWCL	WHITE CLIP LEVEL	F0	F0
49	EYFA	Y FADE CONTROL	80	80
4A	ESET	Y SET-UP LEVEL	00	00
66	AETR	AUTO IRIS TARGET	54	54
68	AGMI	AGC MINIMUM	50	50
69	AGMA	AGC MAXIMUM	B9	B9
6A	AEBL	AE BLC	45	45

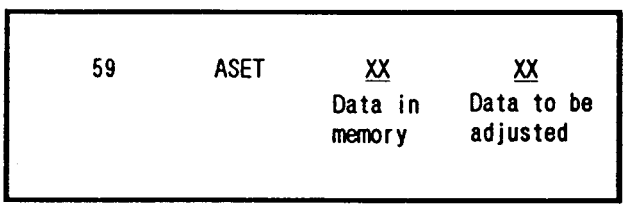
Mode	Name of adjustment	Data 1	Data 2
00	Y GAMMA GAIN	90	90
01	VOLTAGE SUB	66	66
02	IRIS CONTROL	7A	7A
03	AGC CONTROL 1	40	40
04	AGC CONTROL 2	00	00
05	VOLTAGE RESET GATE	62	62
06	HALL REF	26	26
07	C GAMMA	00	00
08	ZOOM TRACK ADJ.	85	85
09	AUTO VSUB	65	NO USE
0A	AUTO RESET GATE	62	NO USE
0B	DSP STATUS REG.	00	00
0C	RAM ADRESS REG.	00	00
0D	RAM DATA LOW BYTE	00	00
0E	RAM DATA HIGH BYTE	00	00
0F	DM COMMAND REG.	04	04
10	DIS CONNAMD	02	02
11	AUTO KNEE COEF 1	00	00
12	AUTO KNEE COEF 2	68	68
13	APERTURE GAIN CONTROL	F0	F0
14	COLOR SEPARATION COEF 1	21	21
15	COLOR SEPARATION COEF 2	33	33
16	AUTO KNEE POINT	D0	D0
17	NOISE SLICE LEVEL	02	02
18	EDGE CHROMA GAIN	00	00
19	CCR GAIN	40	40
1A	CCB GAIN	40	40
1B	YL GAIN	80	80
1C	S/I LOW THRESHOLD	0B	0B
1D	S/I HIGH THRESHOLD	0B	0B
1E	R PRE-WHITE BALANCE	40	40
1F	G PRE-WHITE BALANCE	20	20
20	B PRE-WHITE BALANCE	40	40
21	R WHITE BALANCE	3C	3C
22	B WHITE BALANCE	47	47
23	DARK SLICE R	02	02
24	DARK SLICE B	00	00
25	DARK SLICE G	FD	FD
26	R-Y HUE	19	19
27	B-Y HUE	19	19
28	R-Y GAIN	34	34
29	B-Y GAIN	24	24
2A	MATRIX COEF A1	B3	B3

Mode	Name of adjustment	Data 1	Data 2
2B	MATRIX COEF B1	4B	4B
2C	MATRIX COEF A2	1C	1C
2D	MATRIX COEF B2	E4	E4
2E	S/I COMMAND REG.	01	01
2F	COLOR STATUS REG.	00	00
30	-	00	00
31	-	00	00
32	Y SET-UP START DATA	50	50
33	Y.S OFF-SET 1(AGC=OFF)	90	90
34	Y.S OFF-SET 2(AGC=80)	88	88
35	Y.S OFF-SET 3(AGC=MAX)	88	88
36	Y.S CONTROL 1(AGC=OFF)	6A	6A
37	Y.S CONTROL 2(AGC=80)	54	54
38	Y.S CONTROL 3(AGC=MAX)	85	85
39	AWB HALL REF.	80	80
3A	AF2 DATA DEC.	20	20
3B	AF UNSTABLE REF.	0A	0A
3C	R-Y GAIN CONTROL 2	33	33
3D	AWB AEAVR DEC.	03	03
3E	R.B CONTROL BOUNDARY	55	55
3F	AWB STOP OFF-SET	10	10
40	OUT DOOR HALL	56	56
41	HORIZENTAL PRESET	08	08
42	VERTICAL PRESET	08	08
43	HORIZENTAL POSITION	1A	1A
44	VERTICAL POSITION	1F	1F
45	B-Y BURST CARRIER GAIN	D3	D3
46	R-Y BURST CARRIER GAIN	27	27
47	CHROMA FADE CONTROL	40	40
48	WHITE CLIP LEVEL	F0	F0
49	Y FADE CONTROL	80	80
4A	Y SET-UP LEVEL 1	00	00
4B	Y SER-UP LEVEL 2	02	02
4C	ENCORDER COMMAND 1	A0	A0
4D	ENCORDER COMMAND 2	04	04
4E	T.G COMMAND 1	00	00
4F	T.G COMMAND 2	00	00
50	LOW LIGHT CNSP	08	08
51	LOW LIGHT CNSL	72	72
52	AUTO IRIS	00	00
53	AUTO AGC	00	00
54	AUTO HALL	00	00
55	AUTO WHITE BALANCE	00	00

Note On table you see the "XX XX" for DATA 1/DATA 2 "XX XX" means arbitary value.

Mode	Name of adjustment	Data 1	Data 2
56	OUTDOOR R-Y COEF	0B	0B
57	HALL OF IRIS CLOSED	0C	0C
58	CNSL OF D-ZOOM	20	20
59	AUTO SET-UP	00	00
5A	-	CC	CC
5B	OUTDOOR B-Y GAIN	15	15
5C	OUTDOOR R-Y GAIN	29	29
5D	OUTDOOR B HUE	15	15
5E	AWB R BLACK POINT	86	86
5F	AWB B BLACK POINT	78	78
60	-	00	00
61	FOCUS RESET L	00	00
62	FOCUS RESET H	06	06
63	ZOOM RESET L	A4	A4
64	ZOOM RESET H	07	07
65	ZOOM TRACK DATA	B7	B7
66	AUTO IRIS TARGET	54	NO USE
67	AGC START HALL	A4	A4
68	AGC MINIMUM	50	50
69	AGC MAXIMUM	B9	B9
6A	AE BALANCE	45	45
6B	R INDOOR	3E	3E
6C	B INDOOR	7B	7B
6D	R OUTDOOR	6C	6C
6E	B OUTDOOR	4A	4A
6F	AGC ON CS	56	56
70	PEAK RATIO	20	20
71	HALL ADJ. START	40	40
72	IRIS ADJ. START	70	70
73	AGC RELATED CNS	10	10
74	AGC MINIMUM ADJ. START	28	28
75	AGC MAXIMUM ADJ. START	B8	B8
76	WB INDOOR R START	40	40
77	WB INDOOR B START	80	80
78	WB OUTDOOR R START	58	58
79	WB OUTDOOR B START	58	58
7A	HALL GAIN	82	82
7B	AE TARGET OF AGC MAXIMUM	30	30

< Example of the TV screen >



9-2-2. Camera System Adjustment

NOTE

From now on, the structure of every adjustment is as

STEP	ADJUSTMENT
1. MODE and INPUT SIGNAL/ALIGNMENT TAPE 2. TEST POINT and ADJ. part 3. RESULT & REMARKS	ADJ. part → Test Point ⇢

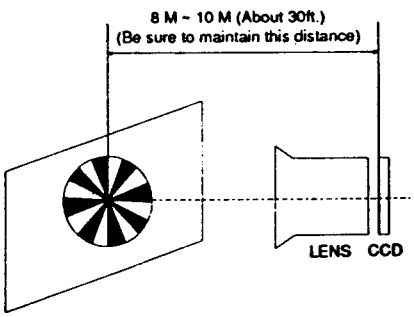
Note: The On-Screen Display Information.
"XX XX" means arbitary value.
It can be different number depend on the con

01	VSUB	XX	XX

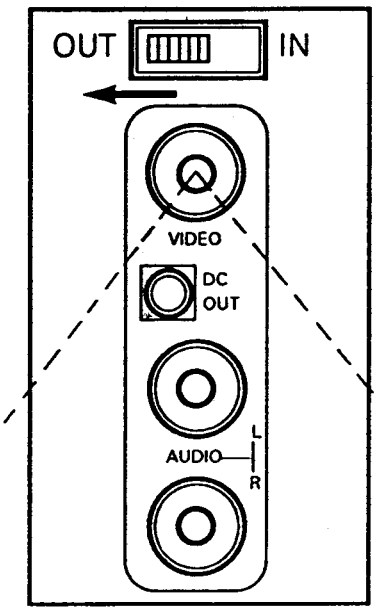
1 FOCUS TO ZOOM TRACKING

Note : To maintain proper focus throughout the zoom range, the focus lens position must be changed as the zoom lens is moved. During this adjustment the microprocessor will measure the focus positioning requirements at the wide and telephoto position of the zoom lens.

1. CAMERA "E-E".
2. Focus Chart (Attached on the last page of this manual) & EVR.
3. 1) Aim the camera at the focus chart placed about 30ft. (8 to 10 meters) away and perpendicular to the center of the lens.
   The chart should be placed on the flat, gray or white wall.
   2) Connect monitor TV jack to video output jack.
   3) Press the "PLAY (MODE UP)" and "STOP (MODE DOWN)" buttons, so that the OSD state is "08 LENS XX XX".
   4) Focus Adjustment (There are two (2) ways to do the adjustment.)
   a. Full Auto : Press "START/STOP(CONFIRM)" button for full auto adjustment.
   The camera will move both zoom and focus lens. The adjustment is finished when the O.K message appears on the TV screen.
   b. Manual : Camera lens will be moved to all positions to set maximum focus setting.
   b-1. Manual adjustment by pressing the "TELE" button.
   The zoom lens should move to the middle angle position.
   b-2. Press the "WIDE" button to instruct the microprocessor to adjust the focus lens for optimum focus.
   b-3. Press the "START/STOP (CONFIRM)" button.
   The zoom lens should move to the tele zoom position.
   b-4. After the zoom lens reaches the Tele zoom position, repeat step **b-2**.
   b-5. Press the "START/STOP (CONFIRM)" button.
   The zoom lens should move to the middle zoom position.
   b-6. After the zoom lens reaches the middle zoom position, if focus state is not the optimum focus state, repeat step **b-2**, **b-3**, **b-4** and **b-5**.
   b-7. Press "START/STOP (CONFIRM)" button.
   The zoom lens should move to the wide zoom position, try to step **b-2**.
   b-8. Press "START/STOP (CONFIRM)" button to instruct the micro processor to write the focus lens position data to the EEPROM.
   The lens will move through the zoom range and the picture will fade out and then back in. The OSD will display "OK".



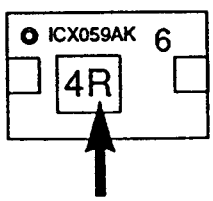
A/V JACK



2 V SUB

1. CAMERA "E-E", no signal input.
2. Video output jack & EVR.
3. * Connect monitor TV to video output jack.
   * Press the "PLAY (MODE UP)/STOP (MODE DOWN)" button so that the OSD state is "01 VSUB XX XX".
   * V SUB specified voltage is indicated by one digit. (Rear of the CCD image sensor)
   * Adjust the "SELF TIMER (DATA UP)/INT.REC (DATA DOWN)" button so that the data is the specified HEX value.
   * Be sure to press the "START/STOP (CONFIRM)" button to memorize setting.

EXAMPLE



★ ICX059AK : CCD Device name

★ 4 : RG code address

★ R : V SUB voltage code address

R = 14.5V —> 8B

(Rear of the CCD image sensor)

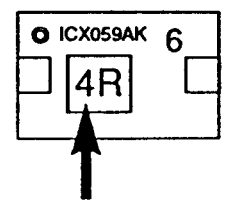
(Table for V SUB Voltage)

Digit	V SUB Voltage	HEX Value	Digit	V SUB Voltage	HEX Value	Digit	V SUB Voltage	HEX Value
E	9.0V	44	m	12.5V	62	U	16.0V	7F
f	9.5V	48	N	13.0V	66	V	16.5V	84
G	10.0V	4D	p	13.5V	6A	W	17.0V	88
h	10.5V	51	Q	14.0V	6E	X	17.5V	8D
J	11.0V	55	R	14.5V	73	Y	18.0V	91
k	11.5V	59	S	15.0V	77	Z	18.5V	96
L	12.0	5E	T	15.5	7B	-	-	-

3 RG (Reset Gate)

1. CAMERA "E-E", no signal input.
2. Video output jack & EVR.
3. * Connect monitor TV to video output jack.
   * Press the "PLAY (MODE UP)/STOP (MODE DOWN)" button so that the OSD state is "05 V RG XX XX".
   * RG code is indicated by one digit. (Rear of the CCD image sensor)
   * Adjust the "SELF TIMER (DATA UP)/INT.REC (DATA DOWN)" button so that the data is the specified HEX value.
   * Be sure to press the "START/STOP (CONFIRM)" button to memorize setting.

EXAMPLE



★ ICX059AK : CCD Device name

★ 4 : RG voltage code address

4 = 2.5V —> 80

(Rear of the CCD image sensor)

(Table for RG Voltage)

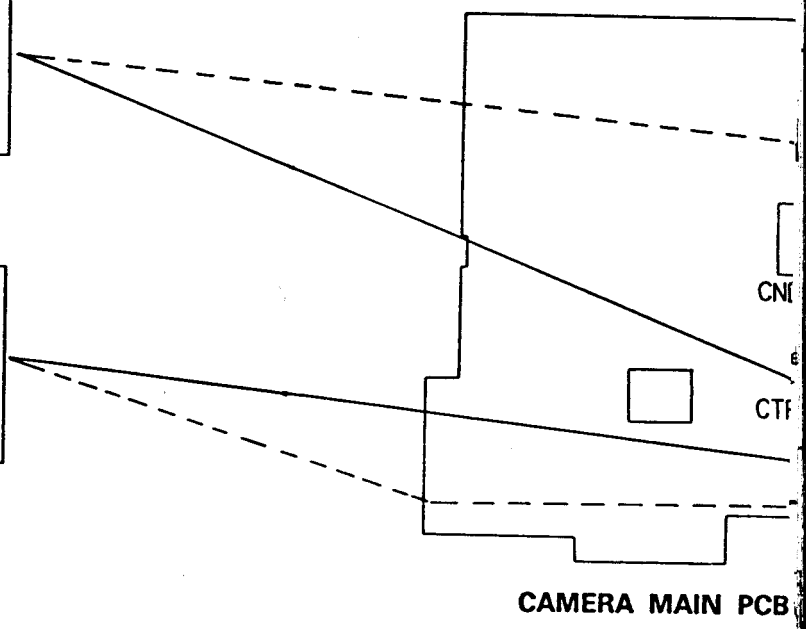
DIGIT	1	2	3	4	5	6	7
V RG VOLT	1.0	1.5	2.0	2.5	3.0	3.5	4.0
HEX Value	32	4D	67	80	9B	B7	D0

4 P. CLK ADJUSTMENT

1. "CAMERA", no signal input.
2. TP01 & CTP01.
3. * Connect a frequency counter to TP01.
   * Adjust CTP01 for **14.1875MHz ± 100Hz**.

5 PLL ADJUSTMENT

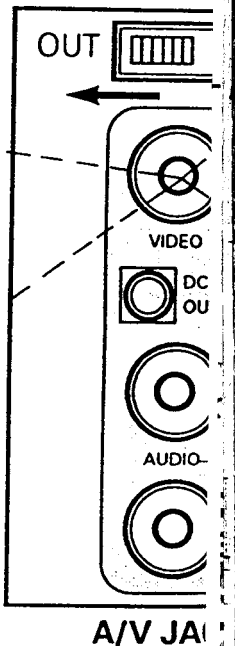
1. "CAMERA", no signal input.
2. TP02 & CTP02.
3. * Connect a frequency counter to TP02.
   * Adjust CTP02 for **D.C 2.5V ± 0.1V**.



CAMERA MAIN PCB

6 AUTO SET-UP LEVEL

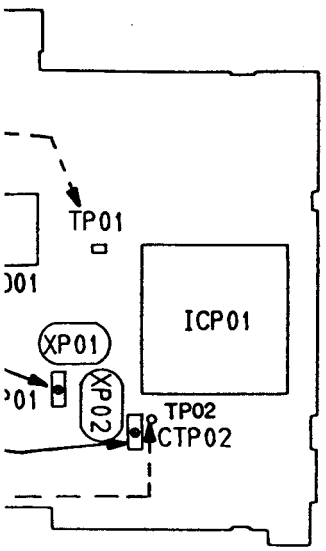
1. CAMERA "E-E", 3100° K gray-scale chart.
2. Video output jack & EVR.
3. * Connect video output jack to waveform monitor input jack and monitor TV jack respectively.
   * Press the "PLAY (MODE UP)/STOP (MODE DOWN)" button so that the OSD state is "59 ASET XX XX".
   * Press the "START/STOP (CONFIRM)" button, and then the microprocessor will work.
     - Closed the IRIS.
     - Set AGC to AGC 00, AGC 80 and AGC max,
     - and then find the data, set-up level is equal to 5IRS, each state.
     - Store the data to mode 36, mode37, mode 38.
   * The OSD shows "OK".



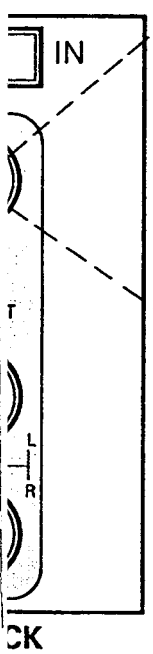
A/V JA

7 AUTO HALL

1. CAMERA "E-E", no signal input.
2. Video output jack & EVR.
3. * Connect monitor TV to video output jack.
   * Press the "PLAY (MODE UP)/STOP (MODE DOWN)" button so that the OSD state is "54 A-HL XX XX".
   * Press "START/STOP (CONFIRM)" button.
   * Then, the microprocessor will work.
     - IRIS closed, FINDS HALL minimum value,
     - IRIS open, FINDS HALL maximum value.
     - Store the data to mode 06.
   * The OSD shows "OK".

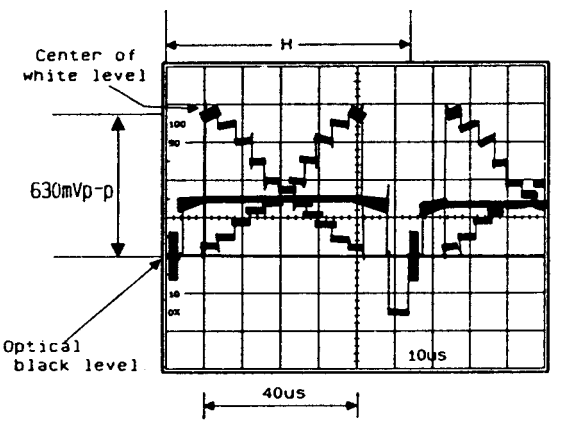


(CONDUCTOR SIDE)



8 AUTO IRIS LEVEL

1. CAMERA "E-E", 3100° K gray-scale chart.
2. Video output jack & EVR.
3. * Connect video output jack to waveform monitor input jack and monitor TV jack respectively.
   * Press the "PLAY (MODE UP)/STOP (MODE DOWN)" button so that the OSD state is "52 A-IR XX XX".
   * Aim the camera at a gray-scale chart evenly illuminated at 1500 to 2000 lux. (Must be 40μs)
   * Press the "START/STOP(CONFIRM)" button, then the microprocess will work;
     - Start IRIS control from the value of mode 72.
     - Find the data, Y level is equal to the AE TARGET of mode 66 **(630mVp-p ± 10mV).**
     - Store the data to mode 02.
   * The OSD shows "OK".



9 AUTO AGC CONTROL

1. CAMERA "E-E", 3100° K gray-scale chart.
2. Video output jack & EVR.
3. * Connect monitor TV to video output jack.
   * Press the "PLAY (MODE UP)/STOP (MODE DOWN)" button so that the OSD state is "53 AGC XX XX".
   * Aim the camera at a gray-scale chart evenly illuminated at 1500 to 2000 lux. (40μs)
   * Press "START/STOP(CONFIRM)" button.
   * Then, the microprocessor will work;
     - FIND AGC minimum point data and store to mode 69.
     - FIND AGC start point data, and store to mode 67.
   * The OSD shows "OK".

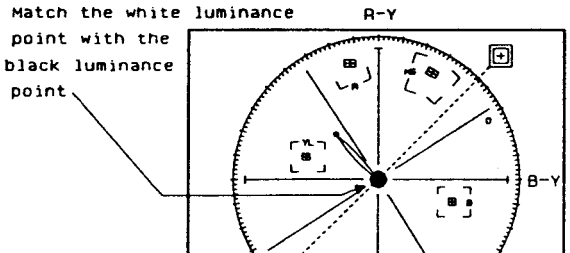
10 AUTO WHITE BALANCE

1. CAMERA "E-E", 3100° K/5100° K gray-scale chart.
2. Video output jack & EVR.
3. * Press the "PLAY (MODE UP)/STOP (MODE DOWN)" button so that the OSD state is "55 AWB XX XX".
   * Connect vectorscope input jack to video output jack.

   1) W/B INDOOR
   - Aim the camera at a 3100° K gray-scale chart illuminated at 1500 to 2000 lux. (40μs)
   - Press "START/STOP (CONFIRM)" button so that the white vector moves to the center on screen of the vectorscope.

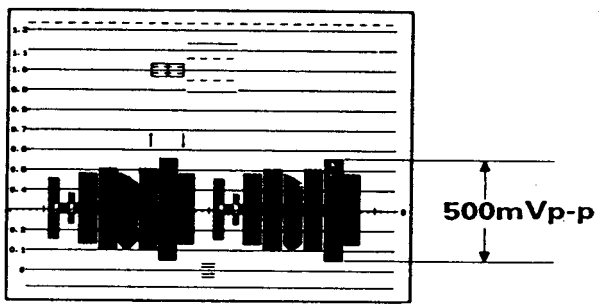
   2) W/B OUTDOOR
   - Aim the camera at a 5100° K gray-scale chart illuminated at 1500 to 2000 lux. (40μs)
   - Press "START/STOP (CONFIRM)" button so that the white vector moves to the center on screen of the vectorscope.

   * The OSD shows "OK".



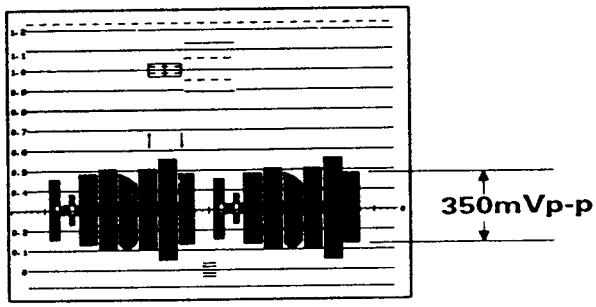
11 R-Y GAIN

1. CAMERA "E-E", 3100° K color bar chart.
2. Video output jack & Register of EEPROM.
3. * Connect video output jack to waveform monitor input jack and monitor TV jack respectively.
   * Press the "PLAY (MODE UP)/STOP (MODE DOWN)" button so that the OSD state is "28 MRYG XX XX".
   * Aim the camera at a color bar chart illuminated at 1500 to 2000 lux.
   * Adjust the "SELF TIMER (DATA UP)/INT.REC (DATA DOWN)" button so that the Red level is **500mVp-p ± 35mV**.
   * Be sure to press the "START/STOP (CONFIRM)" button to memorize setting.
   * The OSD shows "OK".



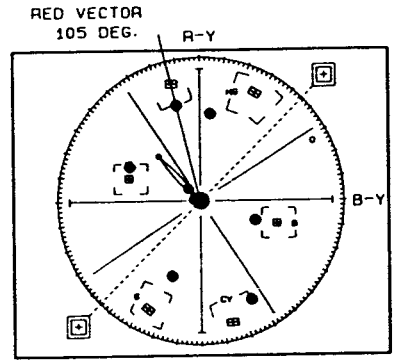
12 B-Y GAIN

1. CAMERA "E-E", 3100° K color bar chart.
2. Video output jack & Register of EEPROM.
3. * Connect video output jack to waveform monitor input jack and monitor TV jack respectively.
   * Press the "PLAY (MODE UP)/STOP (MODE DOWN)" button so that the OSD state is "29 MBYG XX XX".
   * Aim the camera at a color bar chart illuminated at 1500 to 2000 lux.
   * Adjust the "SELF TIMER (DATA UP)/INT.REC (DATA DOWN)" button so that the Blue level is **350mVp-p± 35mV**.
   * Be sure to press the "START/STOP (CONFIRM)" button to memorize setting.
   * The OSD shows "OK".



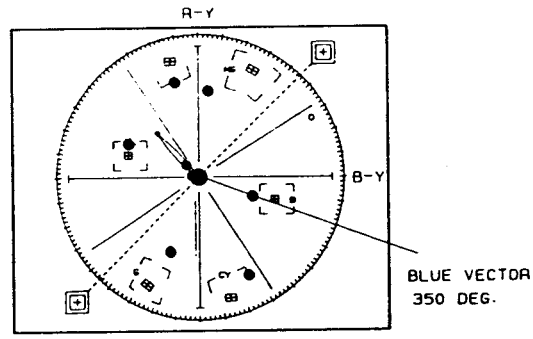
13 R-Y HUE

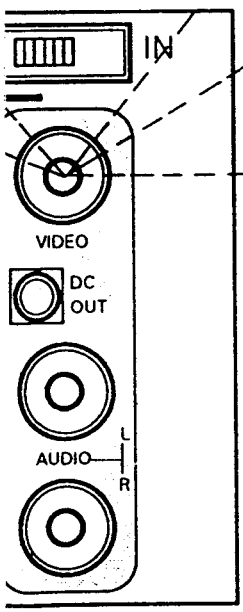
1. CAMERA "E-E", 3100° K color bar chart.
2. Video output jack & Register of EEPROM.
3. * Connect video output jack to vectorscope input jack and monitor TV jack respectively.
   * Press the "PLAY (MODE UP)/STOP (MODE DOWN)" button so that the OSD state is "26 MRHC XX XX".
   * Aim the camera at a color bar chart illuminated at 1500 to 2000 lux.
   * Adjust the "SELF TIMER (DATA UP)/INT.REC (DATA DOWN)" button so that the Red vector **105 ± 15 deg.**
   * Be sure to press the "START/STOP (CONFIRM)" button to memorize setting.
   * The OSD shows "OK".



14 B-Y HUE

1. CAMERA "E-E", 3100° K color bar chart.
2. Video output jack & Register of EEPROM.
3. * Connect video output jack to vectorscope input jack and monitor TV jack respectively.
   * Press the "PLAY (MODE UP)/STOP (MODE DOWN)" button so that the OSD state is "27 MBHC XX XX".
   * Aim the camera at a color bar chart illuminated at 1500 to 2000 lux.
   * Adjust the "SELF TIMER (DATA UP)/INT.REC (DATA DOWN)" button so that the blue vector **350 ± 10 deg.**
   * Be sure to press the "START/STOP (CONFIRM)" button to memorize setting.
   * The OSD shows "OK".





/V JACK

9-2-3. CVF Adjustment

1 LCCOM VOLTAGE

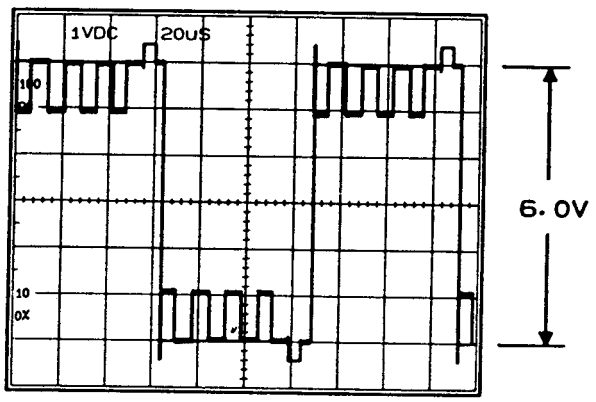
1. VCR "PB", Alignment tape (Color bar : SP).
2. TP-C & VRL06.
3. * Connect digital voltmeter probe to TP-C.
   * Adjust VRL06 so that the voltage is **DC 5.6V ± 0.05V**.

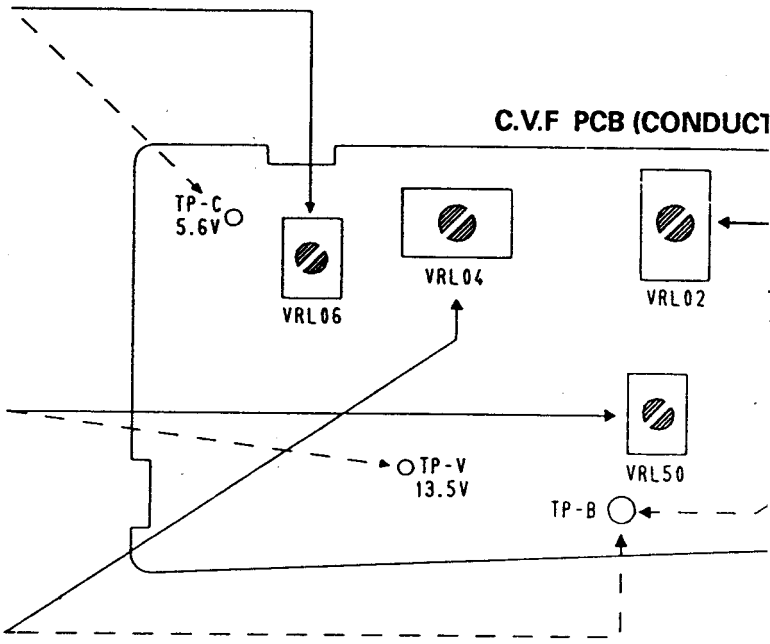
2 13.5V VOLTAGE

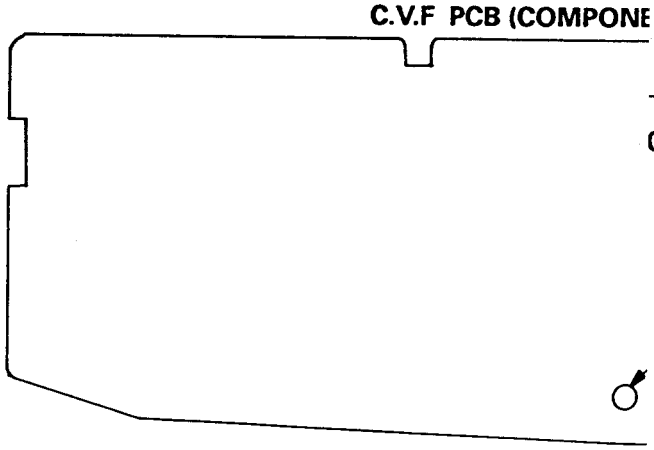
1. VCR "PB", Alignment tape (Color bar : SP).
2. TP-V & VRL50.
3. * Connect digital voltmeter probe to TP-V.
   * Adjust VRL50 so that the voltage is **DC 13.5V ± 0.1V**.

3 BRIGHTNESS

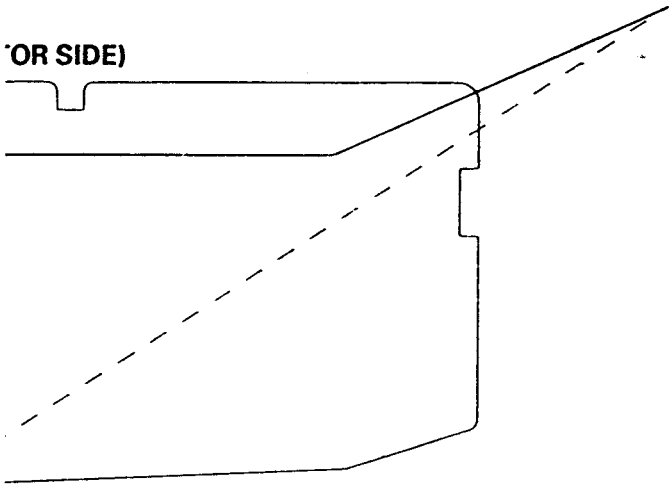
1. VCR "PB", Alignment tape (Color bar : SP).
2. TP-B & VRL04.
3. * Connect an oscilloscope probe to TP-B.
   * Adjust VRL04 so that blue level is **6.0V**.





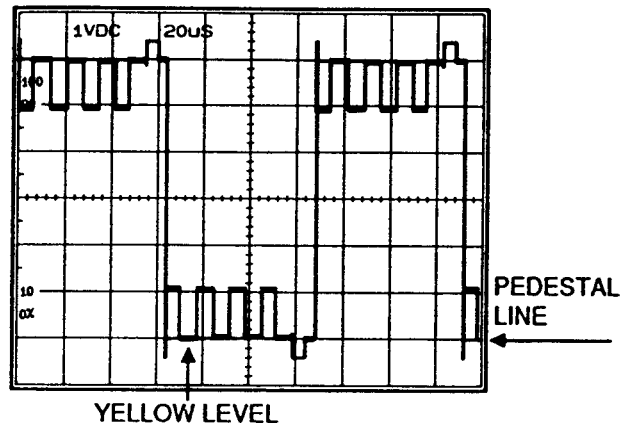


'OR SIDE)

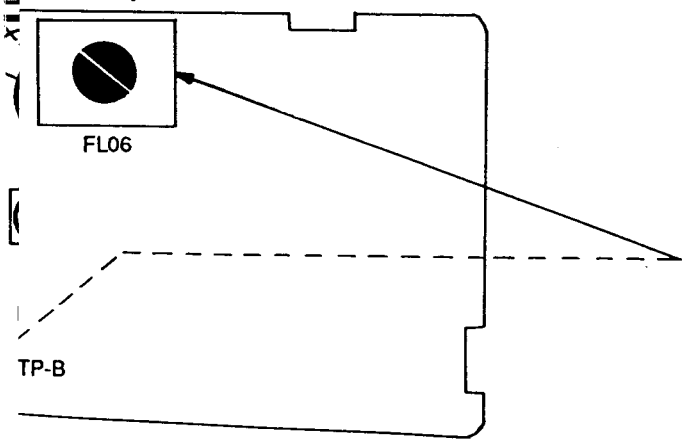


4 COLOR

1. VCR "PB", Alignment tape (Color bar : SP).
2. TP-B & VRL02.
3. * Connect an oscilloscope probe to TP-B.
   * Adjust VRL02 so that yellow level is equal to pedestal line.

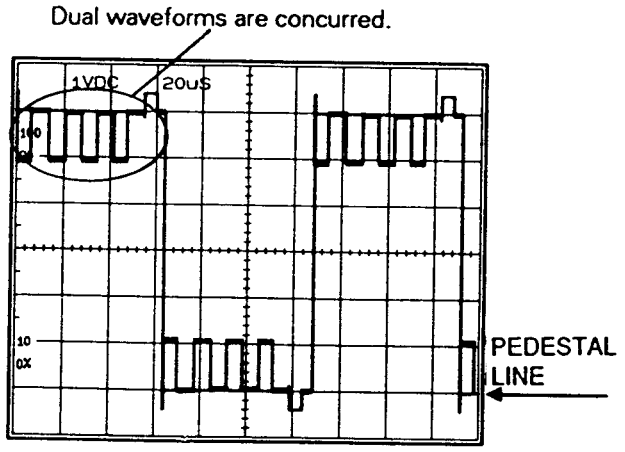


'NT SIDE)



5 TRAP FILTER

1. VCR "PB", Alignment tape (Color bar : SP).
2. TP-B & FL06.
3. * Connect an oscilloscope probe to TP-B.
   * Adjust FL06 so that dual waveforms are concurred.



9-3. VCR SECTION ADJUSTMENT

9-3-1. Preparations

Use the following measuring instruments for adjustment of the VCR block.

1. Equipment to be used

1) Monitor TV
2) Dual trace oscilloscope of over 10MHz band, incorporates delay mode. (Use 10 : 1 probe unless otherwise specified)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) DC power supply
7) Alignment tape (Color Bar : SP)
8) Tracking scope

2. Composition of VCR P.C.Boards

1) Main PCB (System Control/Servo, Video, Pre-Amp)
2) DC/DC Converter PCB
3) Audio PCB
4) Function VCR PCB

3. Connection of equipment

Unless otherwise specified, adjustment is made with the measuring instrument connected as shown in the diagram below.

• CAMERA/VCR power switch . . . . . VCR position

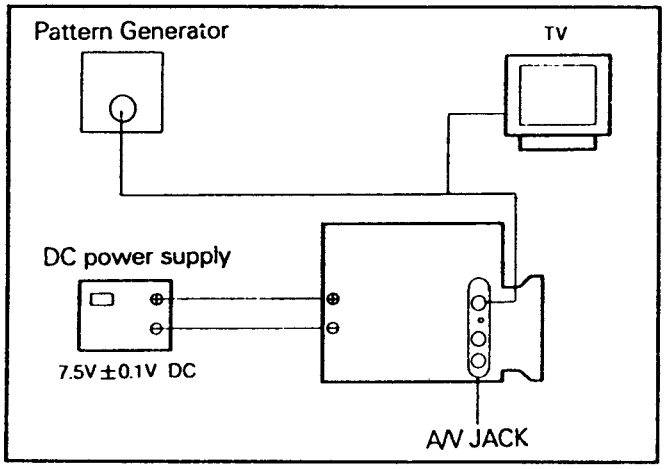


Fig. 1

4. Set-up during adjustment

Since the video output signal obtained from the pattern generator is used as the adjusting signal for the VCR bloc it is necessary that this video output signal be within the required specifications. Connect an oscilloscope to video input jack and make sure that the amplitude of the video SYNC signal is approximately 0.3V, that the video block amplitude is approximately 0.7V, that the burst signal amplitude is approximately 0.3V with flat characteristics, and the signal level ratio between the burst signal and "Re signal is 0.30 : 0.66. The video signal (color bars) used for VCR block electrical adjustment are shown in Fig. 2.

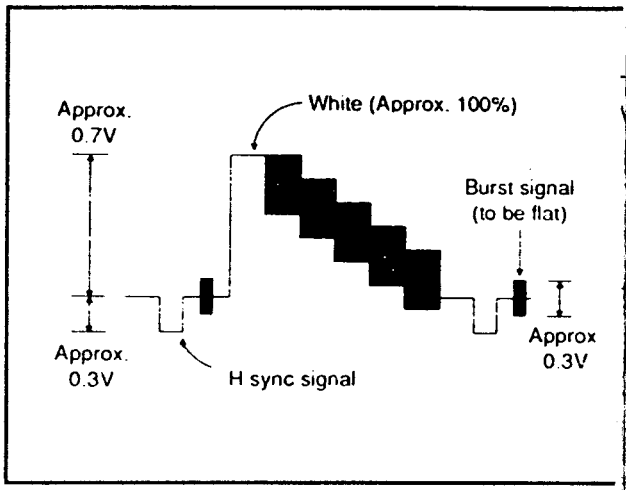
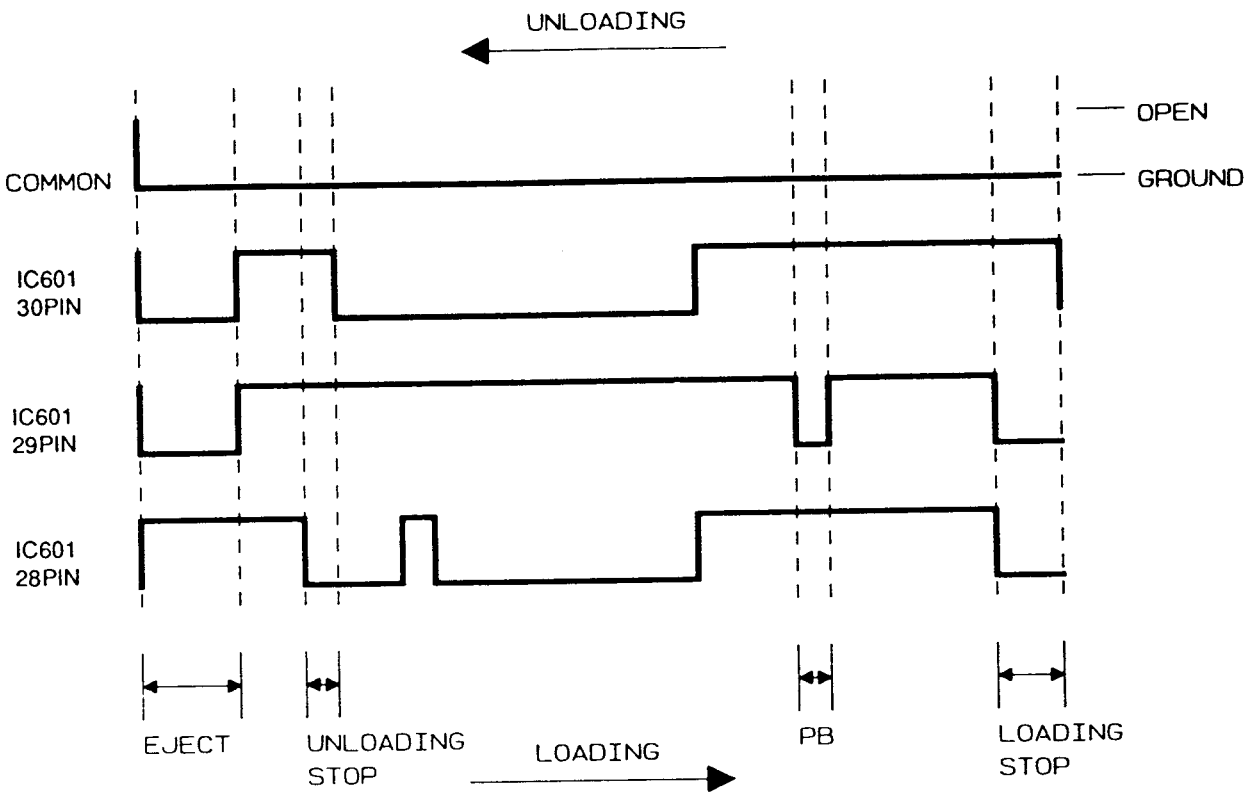


Fig. 2 Color bar signal of pattern generator

Program switch timing chart



POSITION	IC601 30PIN	IC601 29PIN	IC601 28PIN	MODE
EJECT	L	L	H	EJECT
UNLOADING STOP	H	H	L	UNLOADING STOP
LOADING STOP	H	L	L	LOADING STOP
PB	H	L	H	PLAY. FF. REW. STILL. . .

9-3-2. DC/DC CONVERTER Section

NOTE

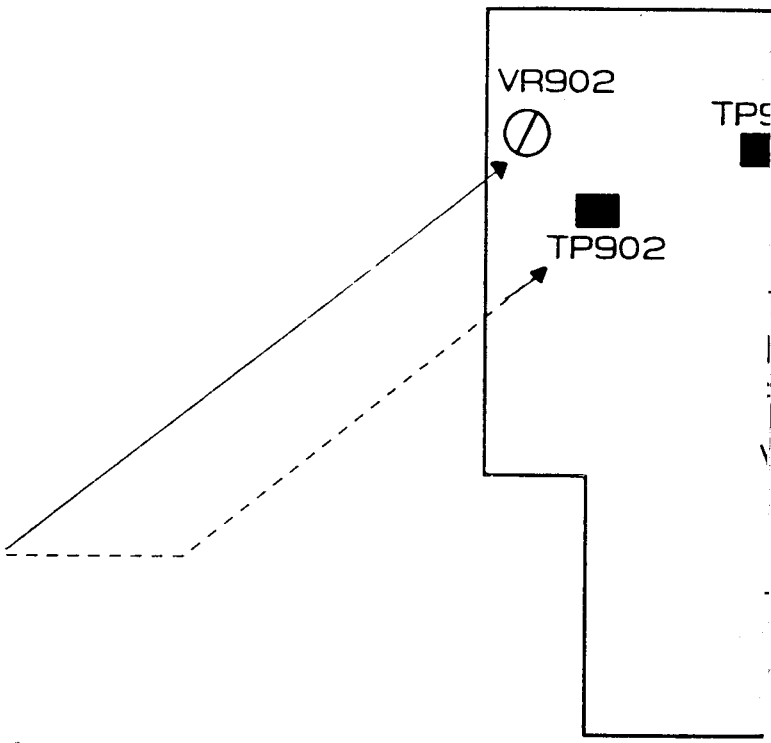
From now on, the structure of every adjustment is as follows.

STEP	ADJUSTMENT
	1. MODE and INPUT SIGNAL/ALIGNMENT TAPE 2. TEST POINT and ADJ. part 3. RESULT & REMARKS

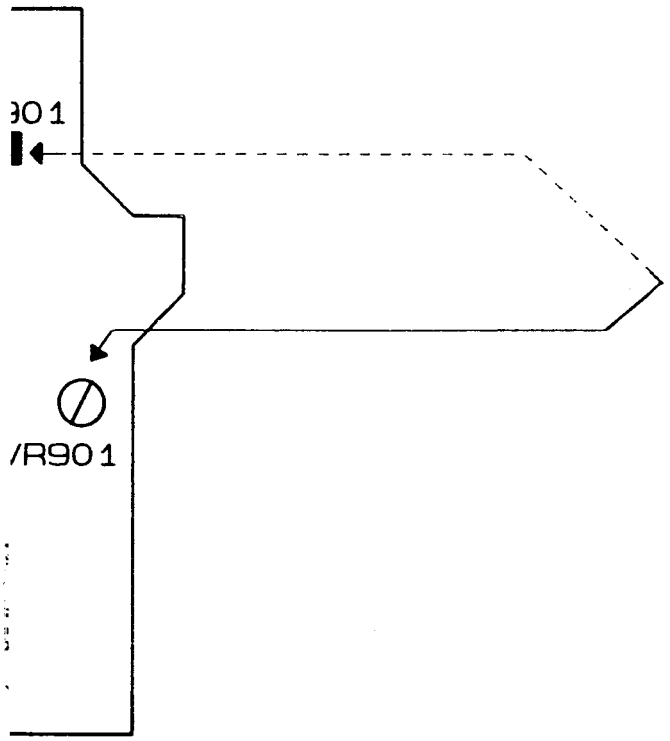
ADJ. part →
Test Point ⇢

2	CAMERA 5V

1. CAMERA & no signal input.
2. TP902 & VR902.
3. * Connect digital voltmeter probe to TP902(DC 5.07V).
   * Adjust VR902 so that the digital voltmeter becomes DC 5.07 ± 0.05V.



DC/DC CONVERTER PCB



1	SS 5V

1. CAMERA, no signal input.
2. TP901 & VR901.
3. * Connect digital voltmeter probe to TP901(DC 5.13V).
   * Adjust VR901 so that the digital voltmeter becomes DC 5.13 ± 0.02V.

(CONPONENT SIDE)

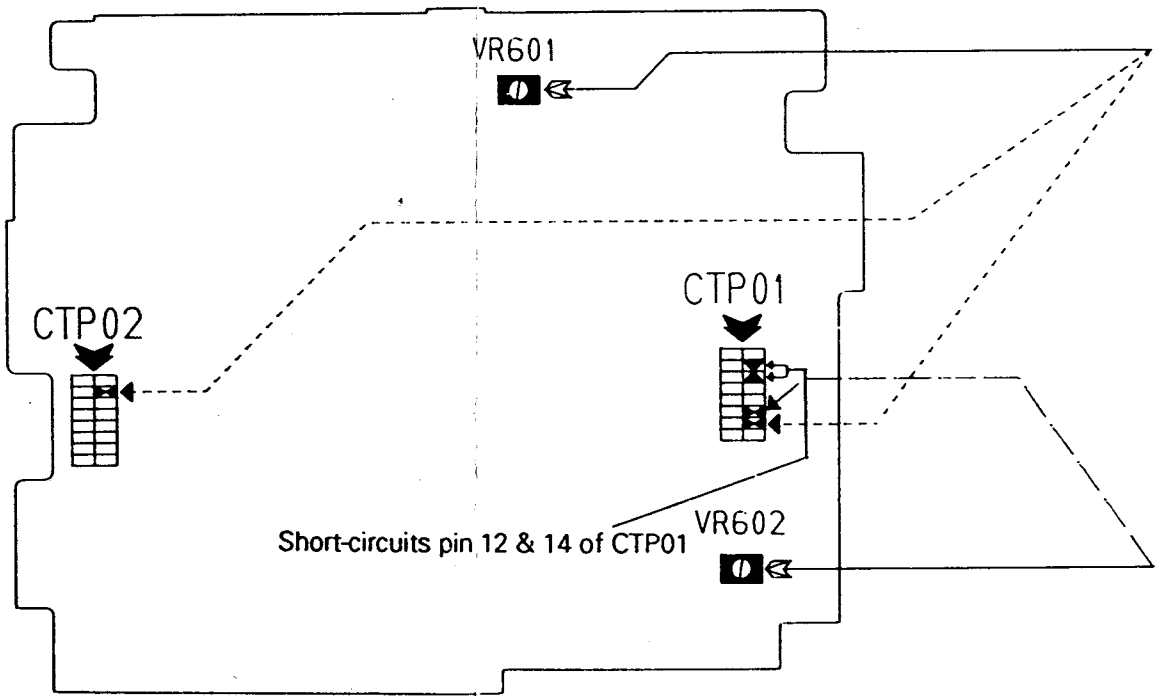
PIN NO. ARRANGEMENT

CTP01

15	16
13	14
11	12
9	10
7	8
5	6
3	4
1	2

CTP02

15	16
13	14
11	12
9	10
7	8
5	6
3	4
1	2



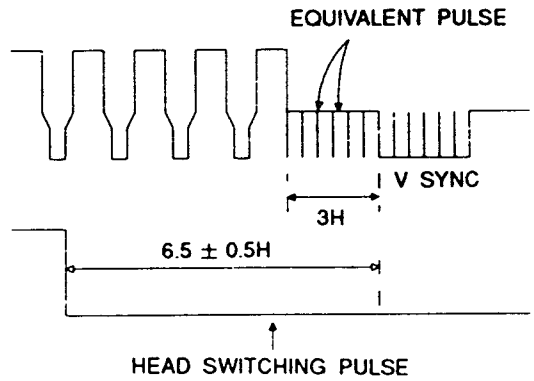
VCR MAIN PCB (CONPONENT SIDE)

1 HEAD SWITCHING POINT

ADJUSTMENT CONDITION

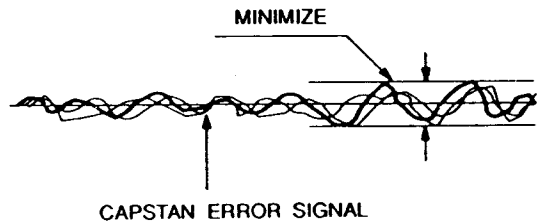
◆ Short-circuit pin 12 and pin 14 (TEST Mode) of CTP01.

1. "PB", Alignment tape (Color bar).
2. Pin 14 of CTP02, Pin 4 of CTP01 (Trigger) & VR601.
3. * Connect an oscilloscope's CH-1 to pin 4 of CTP01 for trigger and CH-2 to pin 14 of CTP02.
   * Adjust VR601 so that the switching point is positioned 6.5 ± 0.5H from the V-SYNC left edge as shown below.



2 CAPSTAN FG

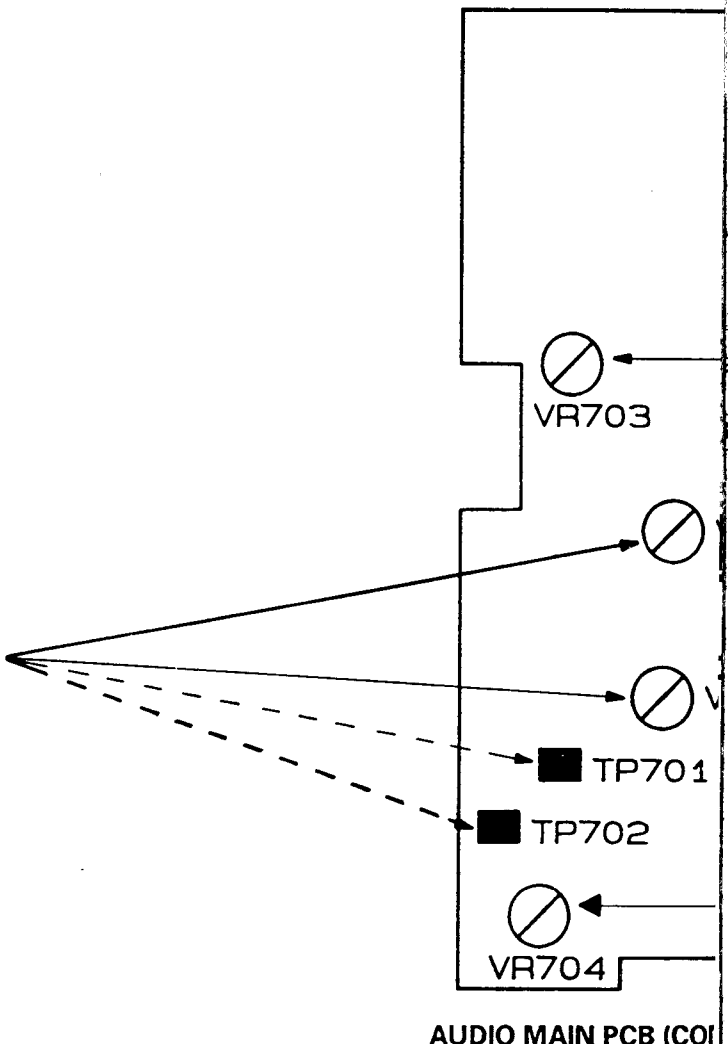
1. "LP-PB", Alignment tape (LP-Color bar).
2. Pin 6 of CTP01 & VR602.
3. * Connect an oscilloscope to pin 6 of CTP01.
   * Adjust VR602 to minimize the width of voltage with LP-PB mode.



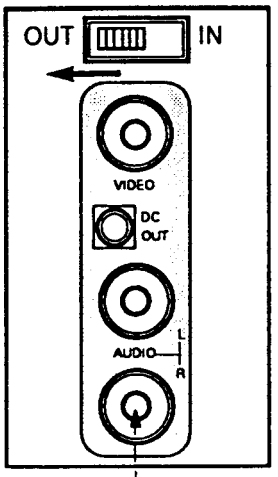
9-3-4. AUDIO Section

1	CARRIER FREQUENCY

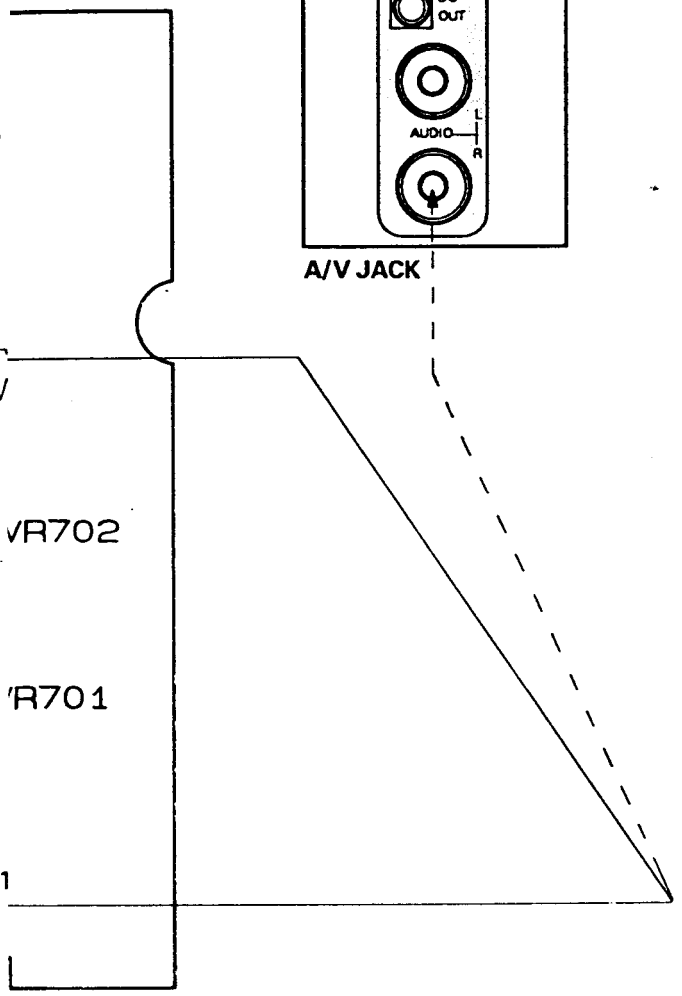
1. "PB", Alignment tape (Stereo).
2. TP701 (L-CH) & VR701 (L-CH),
   TP702 (R-CH) & VR702 (R-CH).
3. * Connect digital voltmeter probes to TP701.
   * Adjust VR701 so that the digital voltmeter becomes DC 2 ± 0.1V.
   * Connect digital voltmeter probes to TP702.
   * Adjust VR702 so that the digital voltmeter becomes DC 2 ± 0.1V.



AUDIO MAIN PCB (COI



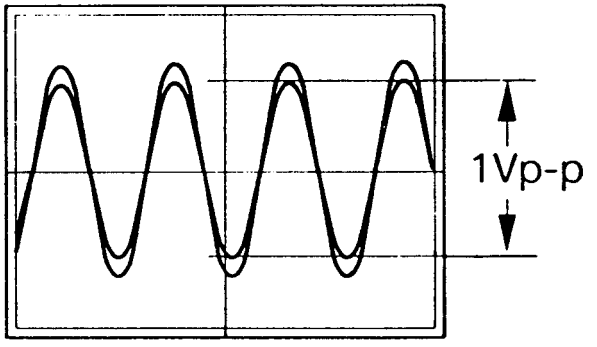
A/V JACK



NPONENT SIDE)

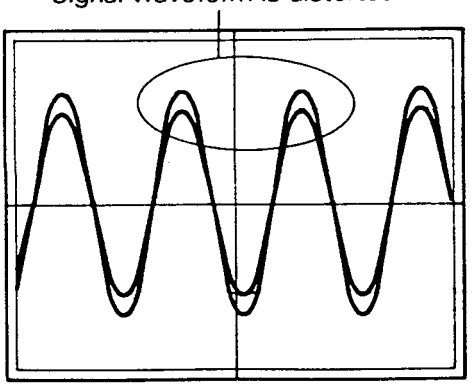
2 DEVIATION

1. "PB", Alignment tape (Stereo).
2. Audio out jack (Right) & VR703 (L-CH), VR704 (R-CH).
3. * Set "IN/OUT" select S/W of A/V jack to "OUT".
   * Connect an oscilloscope to audio out jack "Right".
   * Adjust VR703 so that the output waveform of inner becomes 1.0Vp-p.

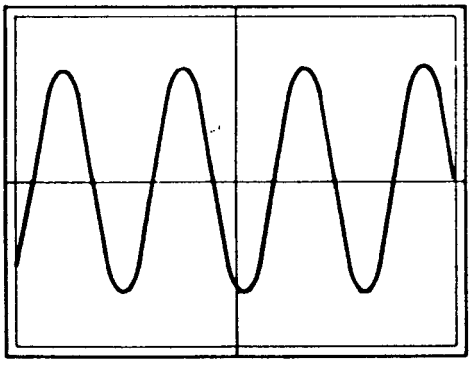


* Adjust VR704 so that the output waveform becomes 1.0Vp-p.

Signal waveform is distorted.



< Before Adjust >

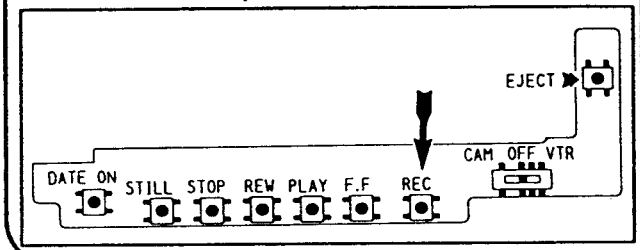


< After Adjust >

9-3-5. VIDEO Section

HOW TO RECORD

Use this method only when VCR is adjusted at recording mode.
- Short-circuits pin 12 & pin 14 of CTP01(TEST A).
- Push the "REC" key on VCR Function board.



TEST A

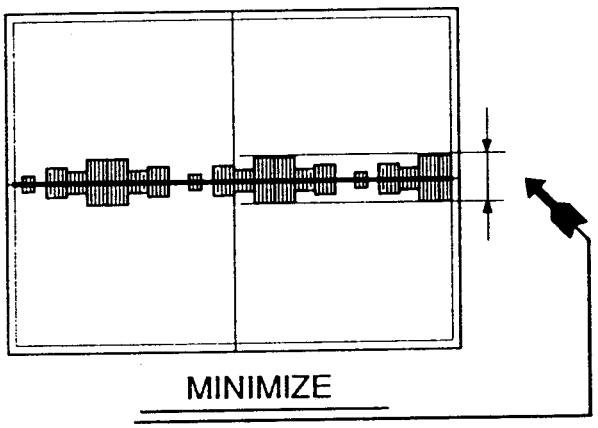
CTP01

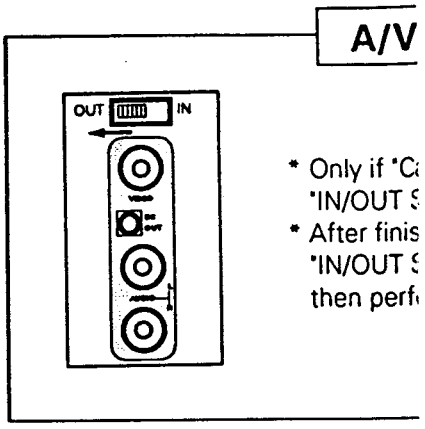
15	16
13	14
11	12
9	10
7	8
5	6
3	4
1	2

Short-circuits pin 12 & pin 14 of CTP01

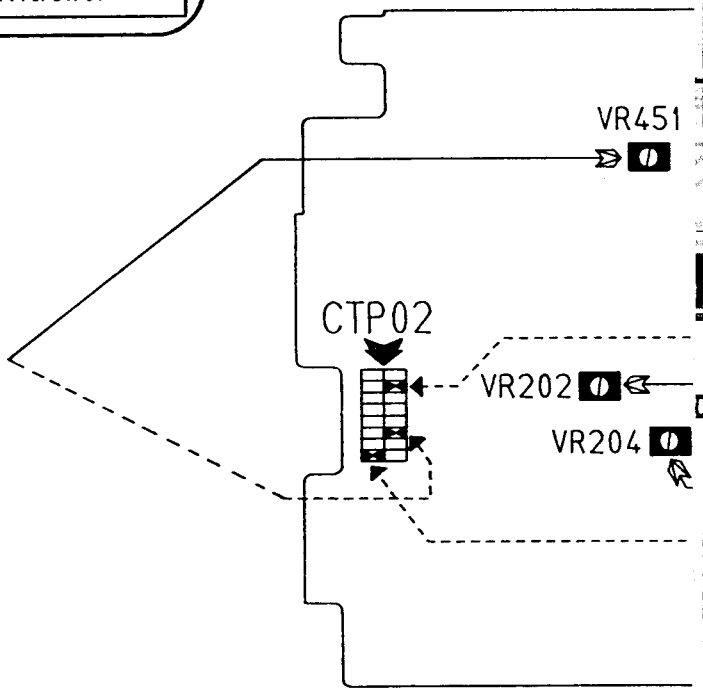
1 CCD COMB

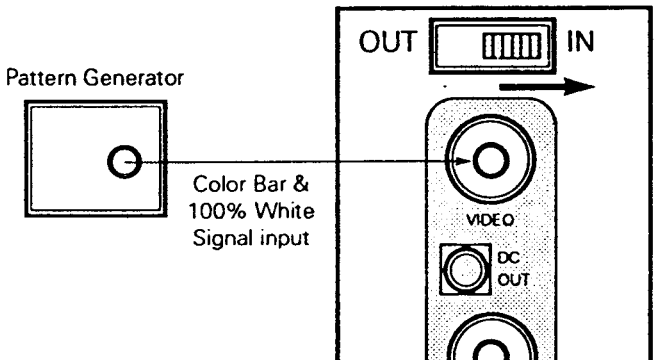
1. "PB", Alignment tape (Color bar).
2. Pin 6 of CTP02 & VR451.
3. * Connect an oscilloscope to pin 6 of CTP02.
   * Adjust VR451 so that the color level is minimum as shown below.





VCR MAIN PCB

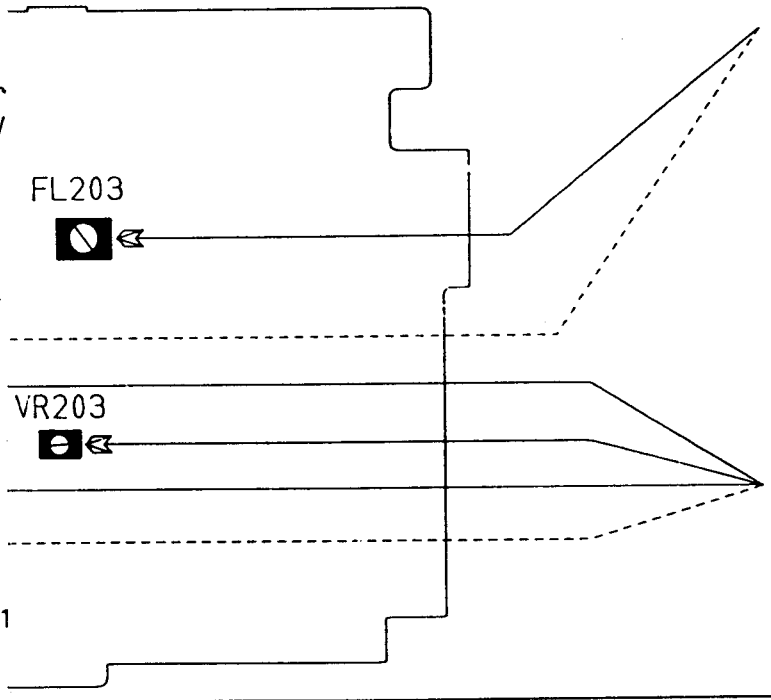




JACK

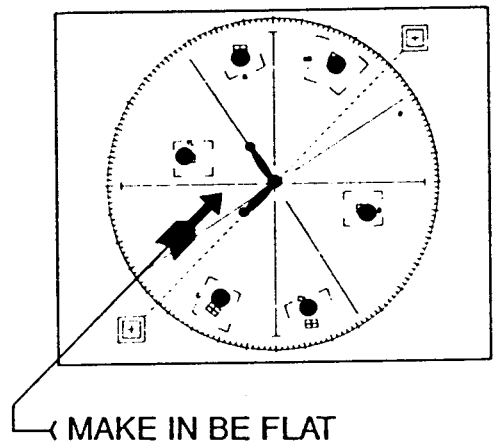
ase Right Ass'y" is disassembled,
Select S/W" is showed.
hing the adjustments, be sure to set
Select S/W" of A/V Jack to "OUT" and
orm the assembling process.

(CONPONENT SIDE)



3 COLOR EMPHASIS (fo)

1. "PB", Alignment tape (Color bar).
2. Pin 14 of CTP02 & FL203.
3. * Set "IN/OUT Select S/W" of A/V jack to "OUT"
   * Connect a vector scope to video jack.
   * Adjust FL203 so that the burst becomes to flat.

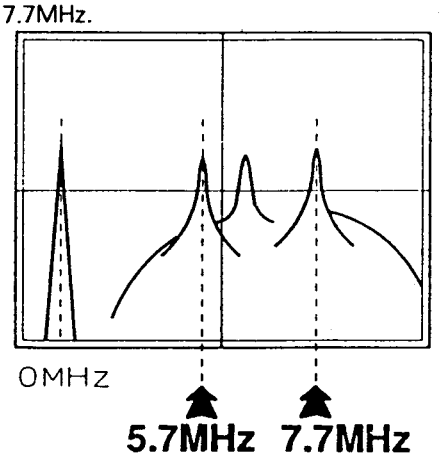


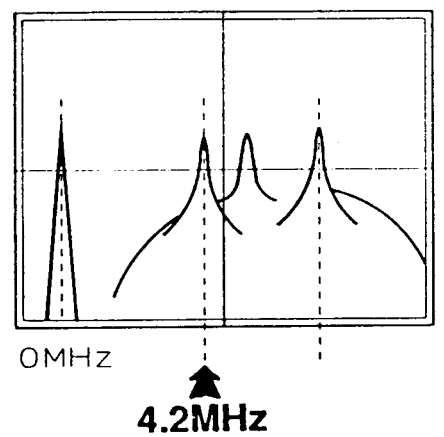
2 Y-FM CARRIER & DEVIATION

1. "STOP", 100% White signal input to A/V jack (VIDEO).
2. Pin 1 of CTP02 &
   Hi-8 Mode : VR202, VR203
   Normal Mode : VR204.
3. * Connect a tracking scope to pin 1 of CTP02.

Hi-8 Mode

* Insert no signal tape (Hi-8)
* Adjust VR202, VR203 so that SYNC TIP signal becomes 5.7MHz, luminance signal becomes 7.7MHz.



Normal Mode

* Insert no signal tape (Normal).
* Adjust VR204 so that SYNC TIP signal becomes 4.2MHz.